



# Clinical Profile And Operative Outcome Of Gallstone Disease At Two Public Hospitals, Harar, Ethiopia, January, 2022

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## ABSTRACT

**Background:** Gallstone disease, also known as cholelithiasis, constitutes a major health problem worldwide. Though previously considered uncommon in African countries, its incidence is on the rise due to urbanization and improved diagnostic capabilities. The aims of this study were to evaluate the clinical profile and operative outcomes of gallstone disease among adults admitted to Hiwot Fana Specialized University Hospital (HFSUH) and Jegol General Hospital (JGH) in Harar, Ethiopia. **Methodology:** A retrospective cross-sectional study was conducted on 180 adult patients admitted between December 2017 and November 2021 from Registry book. Data were analyzed using descriptive statistics and multivariate logistic regression to identify factors associated with postoperative complications. **Result:** Out of 180 patients, 67.2% were female, with the majority (83.8%) aged between 40-59 years. The most common symptom was right upper quadrant pain (77.2%), followed by nausea/vomiting (70.5%) and fatty food intolerance (79.3%). Open cholecystectomy was the predominant surgical method (79.8%), while laparoscopic procedures were rare (4.4%). Postoperative complications occurred in 13.3% of patients, primarily

**Key words:** Clinical profile, iatrogenic bile duct injury and post-operative complications Harar

## I. INTRODUCTION

### BACKGROUND

Gallstone disease, characterized by the formation of stones in the gallbladder, is a common gastrointestinal disorder that affects millions worldwide. The etiology of gallstones is multifactorial, influenced by genetic, dietary, and environmental factors. The two primary types of gallstones are cholesterol stones and pigment stones, with cholesterol stones being more prevalent in Western populations (Lammert et al., 2008). Historically, gallstone disease was considered rare in African populations; however, recent studies indicate a shift in this trend. A systematic review by Akinola et al. (2020) found that the prevalence of gallstones in Africa is increasing, attributed to urbanization, dietary changes, and rising obesity rates. In Ethiopia specifically, research has shown a growing incidence of gallstone disease, with a notable prevalence among women and individuals over 40 years of age (Hailu et al., 2019). Patients with gallstone disease often present with symptoms such as biliary colic, jaundice, and pancreatitis. The clinical manifestations can vary widely depending on the presence of complications like cholecystitis or choledocholithiasis (Khan et al., 2017). In Ethiopian settings, there is limited data on the clinical profiles of patients with gallstone disease, which hampers effective diagnosis and treatment strategies.

Cholecystectomy remains the gold standard for treating symptomatic gallstone disease. Laparoscopic cholecystectomy has revolutionized surgical management due to its minimally invasive nature and quicker recovery times (Bansal et al., 2016). However, outcomes can vary based on factors such as patient demographics, comorbidities, and the availability of surgical expertise. Studies from other regions suggest

that surgical outcomes in developing countries may differ due to resource constraints and variations in healthcare infrastructure (Mok et al., 2018). Given the rising incidence of gallstone disease in Ethiopia and the lack of comprehensive data regarding clinical profiles and surgical outcomes in public hospitals, this study aims to fill this gap. By analyzing cases from two public hospitals in Harar, we hope to provide insights that can inform healthcare policies and improve management strategies for gallstone disease in Ethiopia.

## METHODOLOGY

This hospital-based retrospective cross-sectional study was conducted at Hiwot Fana Specialized University Hospital (HFSUH) and Jugol General Hospital (JGH) in Harar, Ethiopia, from December 1 to 15, 2021. The study aimed to assess post-operative complications in patients with symptomatic gallstone disease over the previous four years (December 2017 to November 2021).

The source population included all patients with symptomatic gallstone disease admitted to the surgical wards of both hospitals. The study population consisted of patients who met specific inclusion criteria, such as being between 18-80 years old and diagnosed with symptomatic cholelithiasis. Patients with incomplete charts or non-gallstone-related conditions were excluded.

Data were collected using patient charts and a semi-structured checklist. Trained BSc nurses and a medical intern in each hospital handled data collection. Variables studied included socio-demographic characteristics, clinical presentations, and ultrasound findings, with post-operative complications being the dependent variable.

Data were analyzed using SPSS version 20, and logistic regression was applied to identify significant associations. Ethical approval was obtained from Jigjiga primary Hospital Research Ethics Review Committee (JPHRERC). Variables of the study contains dependent and independent variable. The study used pre-specified method for the selection of variables. The study used the Stock returns are as dependent variable. From the share price of the firm the Stock returns are calculated. Rate of a stock salable at stock market is known as stock price.

## 4.RESULTS

### 4.1 Socio-demographic Characteristics of Study Participants.

A total of 180 charts were examined. The response rate was 94.4%. Of these 180 charts, 79(43.9%) were from patients who were admitted to JGH and 101(56.1) were from patients admitted to HFSUH. Females constituted 121(67.2%) and Female to male ratio is 2:1. Majority (83.8%) of the patients were in between 40-59 years of age, with mean age of 48years+/-7.7SD. Of total gallstone patients 145(80.5%) came from Urban. (Table 1)

Table 1 sociodemographic characters of the study participants

Variables	Category	Frequency	Percentage (%)
<b>Sex</b>	Male	59	32.8
	Female	121	67.2
<b>Age in years</b>	20-29	17	9.4
	30-39	14	7.78
	40-49	71	39.4
	50-59	64	35.6
	60-69	12	6.67
	70-79	2	1.1
<b>Residency</b>	Urban	119	66.1
	Rural	61	33.9

### 4.2 Clinical profile of patients with gallstone disease

The primary clinical presentation was RUQ in 139(77.2%); an additional 29(16.1%) patients presented with epigastric pain. In addition, a large fraction of these patients 117(65%), had their pain radiated to the rt shoulder and the back and 79.3% reported they had fatty food intolerance. A fraction (7.9%) of patients had jaundice. Nausea/Vomiting was reported in 127(70.5%) and fever was experienced in 44(24.4%). previous similar history was reported in 61(33.9%) and Family history of gallstone disease was present in 77(42.8%). previous history of admission for Acute Cholecystitis was present in 52(28.9%) (Table 2).

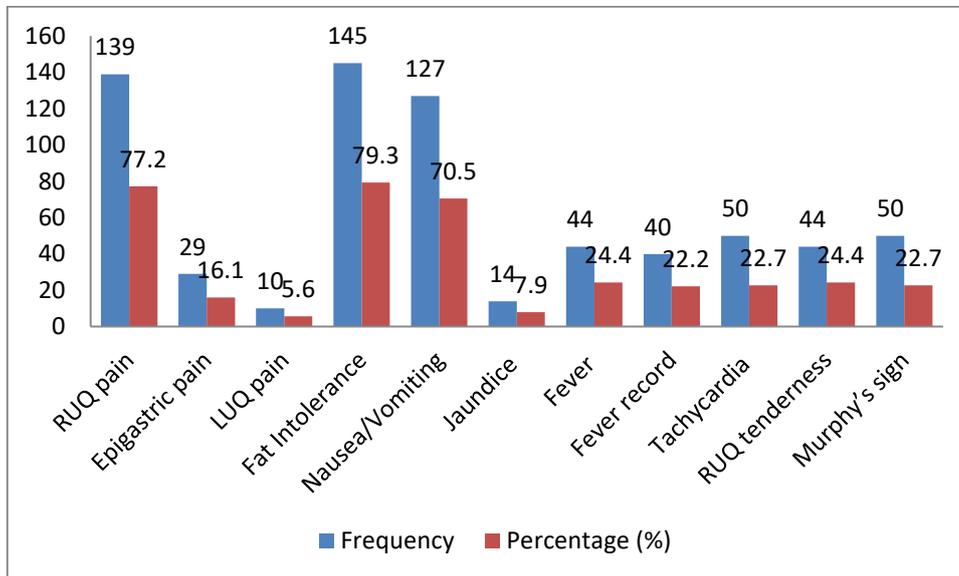


Figure 1 bar chart frequency of distribution of signs and symptoms of patients of gallstone

Physical examination at admission showed that 40(22.2%) had fever record and 41(22.7%) had tachycardia. Murphy's sign was positive in 41(22.7%) and RUQ tenderness was evidenced in 44(24.4%). Ultrasound was done for all of the patients and the finding was gallstone in 94(52.18%), distended gallbladder with gallstone in 39(21.7%) and pericholecystic fluid in 46(25.6%). CBD stone was revealed in 4.2% of patients. (Table 3)

Table 2 abdominal ultrasound findings of patients of gallstone disease

Abdominal ultrasound finding	Management			Total (%)
	Not operated (%)	Open surgery (%)	Laparoscopic surgery (%)	
No sonographic document		1(0.56)		1(0.56)
Gallstone		89(49.4)	5(2.78)	94(52.18)
Distended gallbladder with gallstone		36(20)	3(1.67)	39(21.7)
Thick gallbladder wall/pericholecystic fluid	46(22.56)			46(22.56)
Total	46(22.56)	126(70)		180

Nearly thirteen percent (13.3%) of patients reported concomitant chronic medical illness including Hypertension (8.3%), Diabetes Mellitus (2.2%), Human Immunodeficiency Virus (1.7%). of this group 1.1% were diagnosed with both hypertension and diabetes. (Table 4)

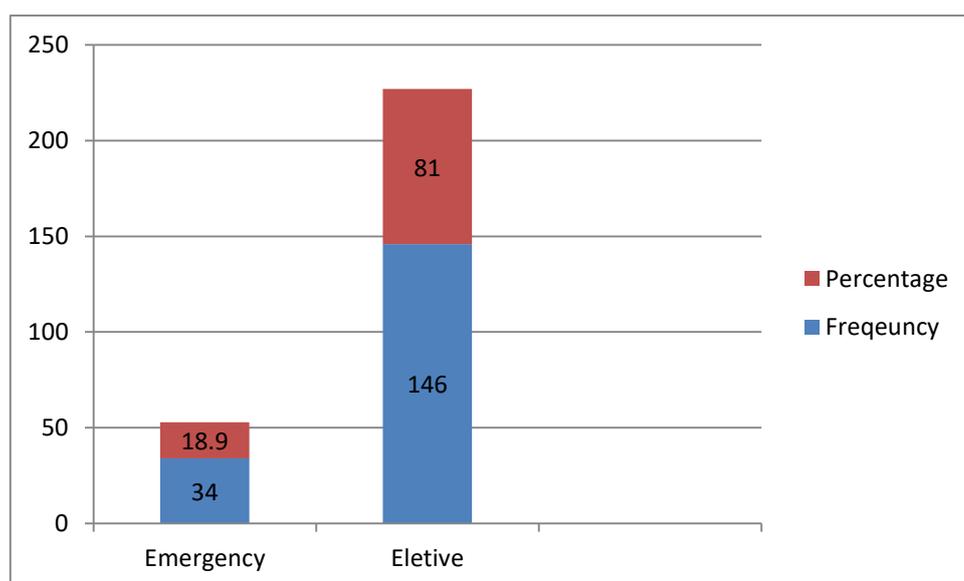
Table 3 concomitant chronic medical illness

Co morbidity	Frequency	Percentage (%)
HTN	15	8.3
DM	4	2.2
HTN and DM	2	1.1
RVI	3	1.7

Review of mode of admission showed that 146(81%) patients were admitted on Elective basis and 34(18.9%) on Emergency base. A total of 148(82.2%) were operated and 32(17.8%) were managed non-operatively. Most of those undergone operation 140(79.8%) had undergone open cholecystectomy and Only 8(4.4%) were operated laparoscopically. Five (3.6%) of those who had open surgery had partial cholecystectomy. CBD exploration was done in 6.7%. Among patients who had cholecystectomy 28.9% of them had previous history of admission for acute cholecystitis at which time they were treated with anti-biotics and were appointed for elective surgery. A fraction of (2.2%) of these patients had two previous history of admission of the same cause. Only 2(1.1%) of the patients who were admitted on emergency basis had emergency cholecystectomy. These patients had recurrent attacks of acute cholecystitis, cholangitis, gallstone pancreatitis and were operated after initial stabilization and anti-biotics. (Table 5)

Table 4 mode of admission of patients of gallstone disease

TYPE	Management			Total (%)
	Not operated (%)	Open surgery (%)	Laparoscopic surgery (%)	
Emergency	32(17.8)	2(1.1)	0	34(18.9)
Elective	0	138(76.67)	8(4.44)	146(81)
Total	32(17.8)	140(79.8)	8(4.44)	180(100)



#### 4.4 Intra Operative complications.

Review of intra operative complications shows that two patients had bile duct injuries. Both patients had open cholecystectomy. Both of these patients had chronic cholecystitis and mirizzi syndrome. (Table 6)

Table 5 intra operative complications

Intra operative complication	Open cholecystectomy	Laparoscopic cholecystectomy
Bile duct injury	2	

#### 4.5 Post-operative complications.

The overall post- operative complication rate of this study was 13.3%. wound infection was the most common (7.2%) followed by pneumonia (3.9%) and bile leak were (2.2%).

Table 6 frequency of post-operative complications

	Variable	Frequency	Percentage (%)
Post-operative complications	Wound infection	13	7.2
	Bile leak	4	2.2
	Pneumonia	7	3.9

The independent variables were evaluated for potential association with post- operative complications after cholecystectomy by using binary regression analysis. Age, murphy's sign, fever, previous history of admission, presence of preoperative cholecystitis (acute/chronic), co-morbidity and mode of admission were found to be significantly associated with post-operative complications and were further analyzed by using multinomial logistic regression. Finally, in the multivariate, binary logistic regression analysis, co-morbidity (AOR,55.2, 95%CI:42.1-67.9), Acute cholecystitis (AOR,14.3, CI:1.4-18.3), and chronic cholecystitis (AOR,32, 95% CI:9.7-59.3), were found to be independent predictors of post- operative complications.

Table 7 multivariate analysis of post- operative complications

Variable	Category	Complication		COR (95%CI)	AOR (95%CI)	P value
		Yes	No			
Acute cholecystitis	Yes	7(4.7%)	3(2%)	43.7(9.6-89)	14.3(1.4-18.3)	<b>0.024</b>
	No	7(4.7%)	131(88.5%)			
Chronic cholecystitis	Yes	9(6.1%)	8(5.4%)	28.4(23.-59.7)	32(9.7-59.3)	<b>0.003</b>
	No	5(3.4%)	126(85.1%)			
Comorbidity	Yes	11(7.4%)	12(8.1%)	37.4(25.3-41.2)	55.2(42.1-67.9)	<b>0.00</b>
	No	3(2%)	122(82.4%)			
Fever	Yes	7(4.7%)	5(3.4%)	19.8(10.3-29.1)	21(17.9-89)	0.92
	No	9(6.1%)	127(85.8%)			
Murph's sign	Yes	10(6.7%)	13(8.8%)	12.9(5.5-38.1)	38.2(21-102)	0.585
	No	7(4.7%)	118(79.7%)			
Previous history of admission	Yes	9(6.1%)	8(5.4%)	28.4(15.7-73.2)	4(1.1-12.1)	0.46
	No	5(3.4%)	126(85.1%)			

## 5. DISCUSSION

Cholelithiasis is a multifactorial disease. One of the main risk factors associated with the development of the disease is the female gender as it is more common among women than men. It is four times higher in women (Pradhan SB1, 2009).

In the present study, the overall Females constituted 121(67.2%), with Female to male ratio is 2:1, a similar pattern seen in most previous reports. Ayder University Hospital with Female 70%, with female to male ratio was 2.5:1 (Mizan kidanu, 2017). In the study done in Gondar University Hospital, the females constituted 51% the female to male ratio was 2:1 (Getachew, 2009). Similarly, a prospective study conducted in one of the referral hospitals of Ethiopia showed a female to male ratio for emergency admissions of 2.4:1 (Alealign *et al.*, 2019).

In our study, the commonest age group affected by gallstone disease was the age group 30-49 years followed by the group 50-59 years of age, accounting for 47.2% and 35.6% of cases respectively. Overall, 82.8% of the patients in this study are in 30-59 years old age group. These results are comparable to those reported by study at Ayder Referral Hospital (Mizan kidanu, 2017), in which 81% of patients were in 30-69 years, and also in TAH in which 80% of patients were between 30-60 years. and Nigerian study which reported ages b/n 40-59 years comprised 52.2%. (Ganiyu A. *et al.*, 2005).

Our study shows that 119(66%) came from Urban which is comparable to study done in Gondar University Hospital where 61.8% were from urban areas (Getachew, 2009) and study done at Ayder University Hospital with 60% from Urban (Mizan kidanu, 2017).

This study shows that 146 (81%) were admitted on elective-basis, while 34 (18.9%) were admitted as emergency. A similar study in another part of Ethiopia showed that acute cholecystitis accounts for 20.4% of the operated chronic and acute cholecystitis patients (Mizan kidanu, 2017). and Nigerian study acute cholecystitis was mode of presentation in 19.4% (Ganiyu A. *et al.*, 2005).

Different complaints are expressed by patients with gallstone disease. The primary symptom of gallstone disease is repeated attacks of pain, often referred to as biliary colic. The pain is usually in the RUQ or the epigastric area. In our study, almost all patients (98.9%) presented with abdominal pain as the main complaint. This, as well as the commonest site being RUQ, is similar to a report from Ayder University Hospital with 99.6% (Mizan kidanu, 2017). Another similar study done in two referral hospitals in Addis Ababa shows rt upper quadrant abdominal pain of 92.8 (Henok Seife, 2021). and Indian study reported 94.4% abdominal pain (Byakodi K. *et al.*, 2018).

Recurrent symptoms and documentation of gallstones in ultrasound studies provide information toward a definitive diagnosis of symptomatic cholelithiasis. In our study, U/S examination, a sensitive, available and affordable diagnostic means, was done in 99.4% of the patients. Similar with our study, the study from Ayder University Hospital showed an ultrasound gallstone detection proportion of 96% (Mizan kidanu, 2017). And another two Hospitals based retrospective study showed (94.9%) (Henok Seife, 2021).

In our study, the majority (84.2%) of the patients had cholecystectomy, 79.8% had open cholecystectomy and laparoscopic cholecystectomy was done in 4.4% of the cases. This is similar to studies done in Ayder University Hospital, which has shown that a majority (81.8%) of the patients had open cholecystectomy (Mizan kidanu, 2017). Conservative treatment is a management option for acute cholecystitis and in our study, 32 (17.8%) cases were managed non-operatively. This is also similar Ayder University Hospital study which showed 18.2% of patients were managed conservatively. The rate of laparoscopic cholecystectomies was lower in our study compared to the experience at Ayder Referral Hospital (30.2%) (Mizan kidanu, 2017). and St. Paulose Hospital with (8.8%). and elsewhere in Nigeria (Shrestha HG, 1991). This is most likely because the surgeons at these centers are not as familiar with the techniques involved with laparoscopic surgery.

In this study, 13.3% of the patients presented with one or more medical comorbidities. The predominant comorbidity was hypertension followed by diabetes and HIV, each accounting for 15(8.3%), 4(2.2%), and 3(1.7%), of these conditions, respectively. The frequency of postoperative complications was higher for individuals in this group. The results of a recent population-based study of the prevalence of HIV revealed an infection rate of <2%, which is similar to our finding. In this study complication rate was 13.3%. and the most common complication was wound infection (7.2%), followed by pneumonia (3.9%) and bile leak which comprised (2.2%). A similar study done in two referral hospitals in Addis Ababa shows complication rate of 10.4%, including wound infection rate of 7.2% and bile leak rate of 0.9% (Henok Seife, 2021). Bile leak rate was higher in this study the reason probably being, a greater number of patients presenting after recurrent acute/chronic cholecystitis. But this study has lower complication rates when compared with Indian study which reported wound infection and bile leak of 12.5% and 5.35% respectively. (Byakodi K. *et al.*, 2018).

The results of our study showed that patients with acute/chronic complications had significant association with development of post-operative complications with p-value of 0.024 and 0.003 respectively and AOR of 14&32 respectively. A similar study done England, which was retrospective multi-institutional study showed that post cholecystectomy complication following Acute/chronic cholecystitis had AOR of 2.25&1.25 respectively (Francisco *et al* 2018). The association were significantly stronger in our study, and the reason for this could be most of the patients had recurrent cholecystitis.

Our study also showed that patients with medical comorbidity had significant association with post-operative complications with p-value of 0.00 and AOR of 55.2. A similar study done in two referral hospitals in Addis Ababa shows medical comorbidity strongly associated with post-operative outcome, with p-value of 0.03 and AOR of 2.455. there was no mortality related to the surgery, in this study.

## 6.LIMITATIONS

This was retrospective study , so there was lack of proper documentation and missing of some data which were not documented.

## 7.CONCLUSION.

It can be concluded that the pattern of cholelithiasis is not different from what has been reported by others from developing settings. Wound infection, biliary leak, and pneumonia are the three predominant complications following cholecystectomy. Patients with recurrent acute cholecystitis, chronic cholecystitis and medical comorbidities are prone to develop postoperative complications. Future studies should focus on prospective, well designed epidemiological studies to determine the risk factors, the types of stones, the relationship between radiologic and intraoperative findings, commonly observed complications, and the frequency and outcome of laparoscopic management among patients with gallstone disease.

## 8.RECOMMENDATION

to regional health bureau by using different ways of health information dissemination: -

- ✓ To increase community awareness about clinical presentation of gallstone disease.
- ✓ To increase the health seeking behavior of the community.
- ✓ Training health professional at health center for early detection and guiding patients for early treatment.

To the hospitals: - It would be wise to take greater care while operating patients with recurrent acute cholecystitis and chronic cholecystitis, and to optimize the conditions of patients with medical comorbidities before attempting surgical management.

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## 10. AUTHORS CONTRIBUTION

All authors they contributed proposal selection, study design, data collection and data processing

## 11. CONFLICT OF INTEREST

All authors they declared that they do not have conflict of interest

## 12. REFERENCE

- Alelign T, Debella A, Tessema TS and Petros B. (2019) Magnitude of Urolithiasis and Cholelithiasis in Ethiopi. Bartoli E, Capron J P.(2000) Epidemiology and Natural History of Cholelithiasis. Rev Prt.. 1; 50(19):2112-6
- Bekele Z, Tegegn K: Cholecystitis: The Ethiopian experience, a report of 712 operated cases from one of the referral hospitals. *Ethiop Med J* 2002; 40(3):209-16
- Byakodi K. G1, STUDY OF CLINICAL PROFILE OF CHOLELITHIASIS IN KIMS, HUBLIJ. *Evolution Med. Dent. Sci./eISSN- 2278-4802, pISSN- 2278-4748/ Vol. 7/ Issue 21/ May 21, 2018*
- Endale Abebe BK. ( 2014) Major Intraoperative Complications of Cholecystectomy in a Teaching Hospital, Addis Ababa, Ethiopia, *COSECSA/ASEA Publication -East and Central African Journal of Surgery*. Volume 19.
- Getachew A. (2009) Epidemiology of gallstone disease in Gondar University Hospital, as seen in the department of radiology. *Ethiopian Journal of Health Development* 22.
- Ganiyu A.(2005) Cholelithiasis and Cholecystitis: Changing Prevalence in an African Community
- Hameed M. Aklan, AASAE, Abdulrahman A. Al-Sadeq, Gebreel A. Eissa, Osamah A. Hassan, Abdullah A. Al-Mikhlaify, Husni Ahmed Abdullah Al-Goshae. (2020) Frequency of Gallbladder Stones Among Patients Underwent Abdominal Ultrasound in a Tertiary Hospital in Sana'a City, Yemen. *Malaysian Journal of Medicine and Health Sciences (eISSN 2636-9346)*.
- Hana Abebe MB. (2021) TRENDS AND OUTCOMES OF CHOLECYSTECTOMY; A COMPARATIVE STUDY OF OPEN AND LAPAROSCOPIC CHOLECYSTECTOMY, A THREE YEAR EXPERIENCE IN A TEACHING HOSPITAL, ADDIS ABABA. *Ethiop Med J* Vol. 59, No. 1.
- Harris.K. (2014) A CLINICAL STUDY OF CHOLELITHIASIS. *MYSORE-570001*.
- Jarnagin wR. (2016) *blumgarts surgery of liver and billiary tract*.
- Joshi HN SA, Shrestha D, Shrestha I, Karmacharya RM. (2020) Clinical Profile of Patients Presenting with Gallstone Disease in University Hospital of Nepal VOL. 18 | NO. 3 | ISSUE 71
- Henok Seife, Adane Desta. A retrospective analysis of operative outcomes of symptomatic biliary stone disease at 2 referral hospitals in Addis Ababa, Ethiopia [published online, 2021 Oct 25]. *East Cent Afr J Surg*. 2021.
- Hiregoudar A, M. R V, Teggimani V and Kabade N. (2018) Study of Clinical Profile of Cholelithiasis in Kims, Hubli. *Journal of Evolution of Medical and Dental Sciences* 7: 2604-2608.
- MICHAEL J.ZINNER SWA. (2013) *Maingots abdominal operation 12th Edition*.
- Mizan kidanu fa. (2017) THE MAGNITUDE AND CLINICAL PROFILE OF GALLSTONE DISEASE. *Ethiop Med J* Vol.55, No. 3
- Nimanya S, Ocen W, Makobore P, Bua E, Ssekitooleko B and Oyania F. (2020) Prevalence and risk factors of gallstone disease in patients undergoing ultrasonography at Mulago hospital, Uganda. *Afr Health Sci* 20: 383-391.
- Pradhan SB JM, Vaidya A. (2009) Prevalence of different types of gallstone in the patients with cholelithiasis at Kathmandu Medical College, Nepal *Kathmandu University Medical Journal* Vol. 7, No. 3, Issue 27, 268-271.
- Shrestha HG, Bajracharya M. Incidence of cholelithiasis and its correlation with cancer of gallbladder at TU Teaching Hospital. *JNMA* 1991;29:264-7
- Song ST, Shi J, Wang XH, Guo YB, Hu PF, Zhu F, *et al.* (2020) Prevalence and risk factors for gallstone disease: A population-based cross-sectional study. *J Dig Dis* 21: 237-245.
- Saad Motawea, Hatem Shalaby, Ashraf Ghanem, Ghada El-Khawaga. Epidemiology of Gallstone Disease among Pregnant women in Egypt:
- Multicenter Study. *BJMMR*. 6(2): 218-225, 2015. DOI <https://doi.org/10.9734/BJMMR/2015/14633>
- Gimu Byakodi & S, Vikram & Hiregoudar, Abhijit & R, Vishwas & Teggimani, Vasant & Kabade, Narayan. (2018). STUDY OF CLINICAL PROFILE OF CHOLELITHIASIS IN KIMS, HUBLI. *Journal of Evolution of Medical and Dental Sciences*. 7. 2604-2608. 10.14260/jemds/2018/586.
- Khan, Zafar & Khan, Muhammed & Brand, Martin. (2020). Increases in cholecystectomy for gallstone related disease in South Africa. *Scientific Reports*. 10. 10.1038/s41598-020-69812-3.